



Early Journal Content on JSTOR, Free to Anyone in the World

This article is one of nearly 500,000 scholarly works digitized and made freely available to everyone in the world by JSTOR.

Known as the Early Journal Content, this set of works include research articles, news, letters, and other writings published in more than 200 of the oldest leading academic journals. The works date from the mid-seventeenth to the early twentieth centuries.

We encourage people to read and share the Early Journal Content openly and to tell others that this resource exists. People may post this content online or redistribute in any way for non-commercial purposes.

Read more about Early Journal Content at <http://about.jstor.org/participate-jstor/individuals/early-journal-content>.

JSTOR is a digital library of academic journals, books, and primary source objects. JSTOR helps people discover, use, and build upon a wide range of content through a powerful research and teaching platform, and preserves this content for future generations. JSTOR is part of ITHAKA, a not-for-profit organization that also includes Ithaka S+R and Portico. For more information about JSTOR, please contact support@jstor.org.

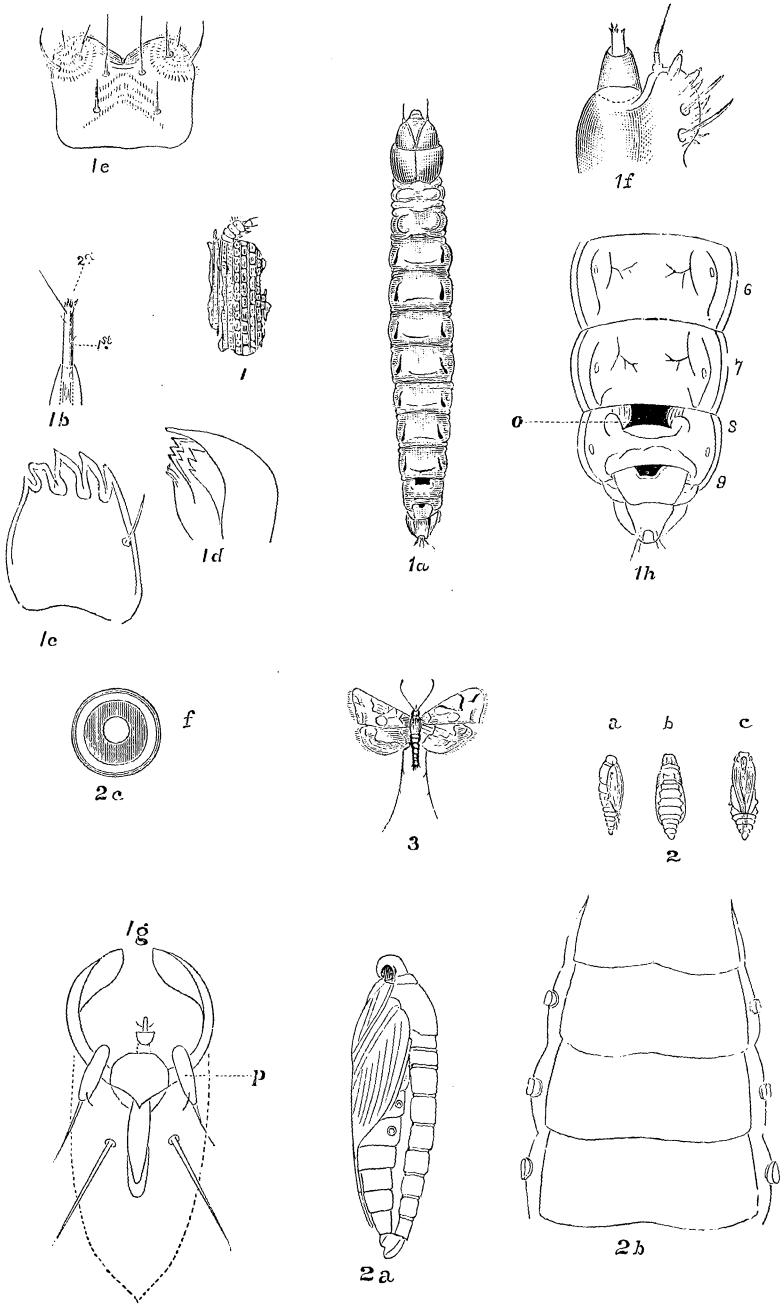
small calyx admits of this robbery, whereas in red rattle (*P. sylvatica*) the large leafy calyx acts as a safeguard." While this may be and doubtless is true of the English Pedicularis, it is not so of our species; notwithstanding the leafy calyx, a large number of the flowers of *P. canadensis* are bitten in just this way. Dr. W. J. Beal informs me that he has observed the same thing in *P. lanceolata*.

This species illustrates an interesting point in regard to the relative time of secretion of nectar and the opening of the flower. In most flowers it is naturally supposed that the nectar is not secreted until the corolla is about to open. Dr. Ogle has shown that this is the case in the cow-wheat. In *P. canadensis*, however, the bee and butterfly visitors habitually plunder the buds by thrusting their tongues in between the folds of the corolla. Very often they thus plunder buds in which the corolla projects less than a quarter of an inch from the calyx, at least several days before the flowers will open. They certainly would not do this did they not obtain nectar. That a certain amount of honey is also secreted after the corolla falls off is shown by the number of ants which visit the empty calyces, as well as the occasional honey bees which visit them.—*Clarence M. Weed, Lansing, Mich.*

ENTOMOLOGY.

HABITS OF AN AQUATIC PYRALID CATERPILLAR.—The habits of the caterpillars of the Hydrocanipinae, a group of Pyralid moths, are unusually interesting, and deserve special attention in this country. We quote from Guenée the following account of them: "The principal title of the family of Hydrocampidæ to the notice of observers, resides in the habits of their caterpillars. Our three most popular entomologists, Réaumur, De Geer and Lyonnet, have observed and described them with all the details fitted for a subject so curious, and have not, so to speak, left anything for their successors to do; I will then give here a hasty analysis of their works. These caterpillars live on the leaves of several aquatic plants, *Nymphæa*, *Potamogeton*, *Lemna*, *Stratiotes*, *Callitiche*, etc., and as most of these plants are, in part, submerged or floating, or at least surrounded with water, it is necessary for our larvæ to have exceptional means of passing through the water, and even of living in almost constant contact with it. It is this which nature has provided, not in a uniform manner, but by varying its means with its ordinary fecundity."

The larva of *Cataclysta*, he says, feeds on leaves too small to enable it to be contained between them, it therefore constructs a cylindrical tube of silk, and strengthens it with leaves placed on the upper side. The case differs from that of *Hydrocampa* in that the tube it constructs is not like a sheath and formed of two bits of leaves, but is broadly cylindrical or oval, and strengthened all around by small leaves of *Lemna*. Moreover the caterpillar



Transformations of *Hydrocampa formosalis*.

lives submerged in the water and attached to the under surface of floating leaves. Its case serves as a cocoon within which to pupate, and it is attached to some aquatic plant. The chrysalis is soft, with the ventral sheath prolonged to the end of the abdomen.

The most curious caterpillar is that of *Paraponyx*, living on plants wholly submerged; it is provided with gills which allow them to decompose the air contained in the water; and they are, as De Geer showed, truly amphibious, because they are provided at the same time with stigmata to respire ordinary air, like other caterpillars.

The caterpillar appears, at first sight, as if furnished with respiratory filaments of different lengths, three or four arising from a common tubercle. It is the only lepidopterous larva known to be provided with tracheary gills.

The chrysalis lives also wholly submerged, constructing between the submerged leaves of the plant which nourishes it, a cocoon composed of a double lining of silk, wherein it changes into a chrysalis. The imago has to pass through the water on leaving its cocoon, so that it is at the beginning of its existence also amphibious.

The last genus, *Hydrocampa*, has caterpillars which are rather thick, attenuated at each end, flattened beneath, with a small retractile head. They live under the leaves of pond lilies in a pod-like sac formed of two bits of leaves stuck together at their edges.

The accompanying drawings, made by Dr. C. F. Gissler, undoubtedly represent a *Hydrocampa* larva. I found it in great abundance May 20, 1882, in its case, made from the leaves of *Menyanthes trifoliata*, in a swamp at Providence, R. I. I failed to prepare a full description either of the larva or pupa, but think that the figures on Plate xxiv, prepared by Dr. Gissler, will enable it to be recognized. I have introduced a figure of the moth, which was observed in great numbers flying over the surface of the water, many being drowned. The larvæ (Fig. 1) were observed living between two pieces of *Menyanthes* leaves, fastened together on the sides. The pod-like sac was oblong, but quite irregular in shape. The caterpillar was dull in color and active in its habits, thrusting its head and three following segments in and out of its case. Fig. 1 represents the worm in its case of natural size; 1a, the caterpillar enlarged about six times; 1b, an antenna; 1c, 1d, the mandibles; 1e, the labrum, much magnified; 1f, the maxilla; 1g, the labium, and p, the palpus; 1h, the end of the body, dorsal view, showing at o a large cleft which can be closed by two lateral fleshy lobes and a posterior fleshy bead; on the succeeding segment is a smaller cleft; the spiracles are seen on the sides of the same segments.

The few caterpillars which I carried home began to spin a

cocoon within the case from June 4–10th; the moths being noticed June 12–13th.

The pupa (Fig. 2–2c), 2, natural size, bulges out considerably on the 4th and 5th abdominal segments. There are only three pairs of spiracles, *i. e.*, on the 2d, 3d and 4th abdominal segments. One of these spiracles (highly magnified) is represented at 2c; their relations to the body at 2b.

The moth was not directly raised from the pupa, but the former were so thick that I have little doubt but that the *Hydrocampæ* captured at the same spot a few days after the larvæ were found, were the imagines of the larvæ under consideration. Seeking for them the next year, none were to be found, though very prolonged search was not made for them for want of time.

The moth found so abundantly, and seen on the following summer at the same date as above recorded, was *Hydrocampa formosalis* of Clemens (Fig. 3. The drawing is a very poor one).

We have in this country four species of *Hydrocampæ*, five of *Cataclysta* and five of *Paraponyx*, and it is to be hoped that many years will not elapse before the larvæ, at least those of the latter-named genus, will be discovered. It is hoped that this note will serve to draw attention to these very curious insects.—*A. S. Packard, Jr.*

NOTES ON SALT-WATER INSECTS, No. III.—Our first article on this interesting subject appeared in the Proceedings of the Essex Institute, Salem, VI, 1869; a second article was published in the *American Journal of Science*, I, Feb., 1871. The present contribution will be a brief one, being a description of a dipterous larva found in the ocean Aug. 28th, on the coast of New Jersey, and forwarded to us alive by Professor A. E. Verrill several years ago; and also of a new species of mite, received at the same time and from the same source.

The body is white, long and slender, cylindrical, tapering gradually from the penultimate segment towards the head; there being twelve segments behind the head. The segments are smooth, but thickened at the hinder edge, the sutures being distinct. The tegument is very thin and transparent, allowing the viscera to be easily distinguished. The terminal segment of the body is conical; seen from beneath it is nearly one-quarter longer than broad, the end subacute and deeply cleft by a furrow which diminishes in size and depth to beyond the middle of the segment, where it fades out. This conical extension is flattened vertically. Above from the middle

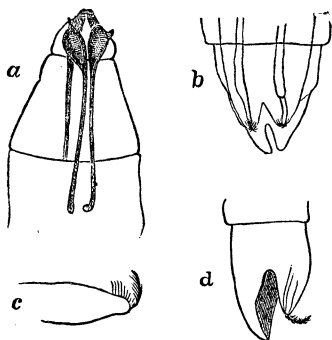


FIG. 1.—Salt-water maggot.

to beyond the middle of the segment, where it fades out. This conical extension is flattened vertically. Above from the middle

of the same segment project two supra-anal, conical, fleshy, respiratory tubercles, one-fourth the length of the entire segment, which separate and close together at the will of the animal. These two tubercles (*b*) give rise to two main longitudinal tracheæ which extend to the head; they end in a tuft of fine setæ.

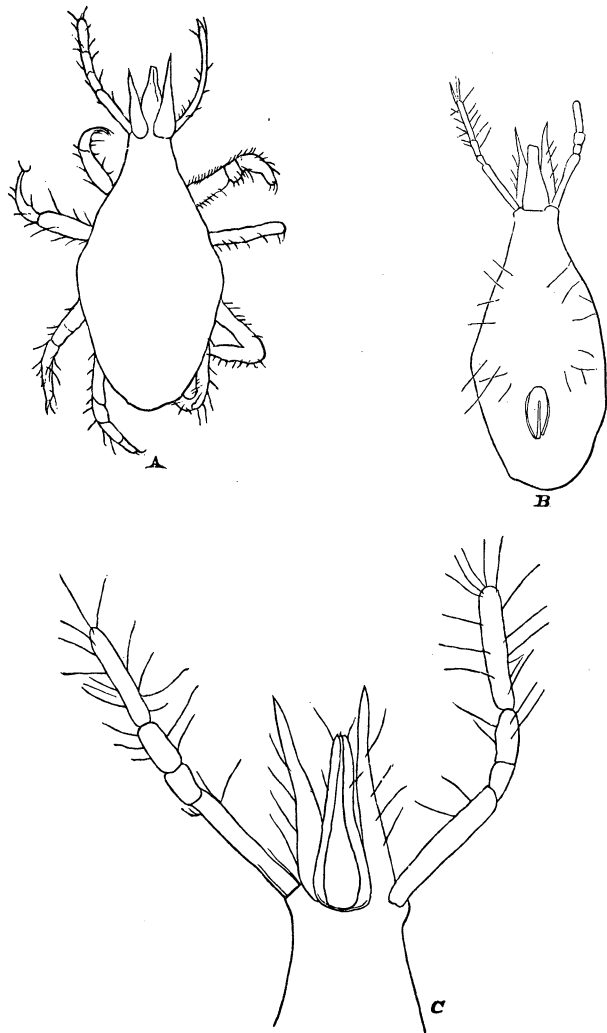


FIG. 2.—*Bdella marina* Pack.

When extended the prothoracic segment is considerably longer than the others. The head is one-third as large as the prothorax and a little more than half as wide. Length .35 inch.

I could not detect any spiracles on either of the thoracic seg-

ments. The tracheæ are not nearly so regular as in the larva of *Anthomyia ceparum*, by the side of which I placed it; though the present larva scarcely appears to belong to the Muscidæ, as there are minute antennæ present, there being no trace of them in the muscid larvæ as a rule.

As represented in the figure at *b*, dorsal view, and *d*, lateral view, two main tracheæ end each in a large dorsal tubercle, each with a tuft of fine respiratory setæ; the cleft ventral plate being fleshy at the tips. One of the respiratory tubercles is represented as seen from the side at *c*; it gives rise to a fan-like series of radiating fine setæ, which are directed upwards and a little forwards towards the base of the tubercle.

A new species of mite was also received from New Jersey through Professor Verrill, which was found living in the sea. It may receive the name of *Bdella marina* (Fig. 2: *A*, upper; *B*, under view; *C*, enlarged view of the proboscis and 2d pair of cephalic appendages, the so-called maxillæ).

The body is slender, pear-shaped; it is apparently eyeless, and the legs are no longer than the body is broad. The proboscis is long, conical; the maxillæ long and slender, acute; extending some distance beyond the end of the proboscis. The maxillary palpi are 4-jointed; the basal a third longer than the two following ones taken together, while the 4th (and last) is a little shorter than the basal joint. (The right palpus is not correctly engraved.) The description is drawn up from camera drawings, the specimen having been lost or mislaid. I cannot state the exact size or color of the animal. It was collected on the shore, but living immersed in the salt water, as I understand from Professor Verrill.—*A. S. Packard, Jr.*

ENTOMOLOGICAL NOTES.—An extraordinary helix-like Psychid case, from East Africa, is reported and figured by Mr. R. McLachlan in the *Entomologists' Monthly Magazine* for June. The case is high and resembles shells of the genus *Cyclostoma* or *Paludina* in a wonderful degree. In some the spiral turns from left to right, in others from right to left. The texture is perfectly hard and firm, and somewhat fibrous.—The Bulletin of the Brooklyn Entomological Society, No. 2, is occupied by an essay preliminary to a monograph of the genus *Catocala*, by Rev. E. D. Hulst. It is illustrated by a plate of details of the external anatomy of these moths, especially the femoral spurs, claspers, and tarsal claws of different species. This society is doing useful work in publishing such synopses and monographs as already have and are promised to appear. We quite agree with Mr. Hulst in his remark that the genus *Catocala* occupies a position between the typical Noctuids and Geometrids, and that it ought to be placed closer to the first than it is, near *Ypsia*, Homoptera and its allies, and that these, "with *Euclidia*, ought to be almost,

if not quite, at the end of the Noctuidæ.”——Francis G. Sanborn, well known as a zealous and enthusiastic collector of insects, and a useful museum assistant, died suddenly June 5th, aged 46, while on a visit to Providence, at the house of George Hunt, Esq. He was one of the curators of the Natural History Society of Worcester. He was an amiable, generous man, and lepidopterists owe much to his willingness to communicate the rarities which he captured.——According to the researches of M. G. Carlet, the muscles of the abdomen of the bee are more numerous than they were supposed to be and, with the exception of the aliform muscles, which subserve circulation, are employed in respiration and consequently in calorification, which is important in the bee's economy. Thus the mechanism of respiration is more complicated than was before believed, since there is not only a lengthening and shortening of the abdomen, but an alternate approach and separation of its dorsal and ventral walls.——M. Ch. Brongniart, in his work upon the fossil insects of the coal beds of Commeny, describes a gigantic neuropter of the curious group of the Dictyoneura. This group contains insects which measure at least half a meter in length and 0.70^m or about two feet four inches in spread of wings.

ZOÖLOGY.

A NEW INFUSORIAN BELONGING TO THE GENUS VORTICELLA.—The following heretofore undescribed infusorian occurs sparingly on the leaflets of *Ceratophyllum* in a pond near to, and often connected with, the Delaware river at Trenton, N. J.:

Vorticella lockwoodii, sp. nov.—Body when expanded broadly campanulate, not conspicuously changeable in form, the length about equaling the width, tapering posteriorly to the pedicel, and constricted beneath the border of the peristome, which is everted and equal in breadth to the entire length of the body; subspherical when contracted, and anteriorly crenulated; ciliary disc not elevated; cuticular surface bearing numerous scattered hemispherical or ovate elevations, diverse in size and usually collected about the equatorial region into irregularly disposed series, each prominence enclosing a nuclear nodule; parenchyma finely granular; contractile vesicles *two*, small, spherical, pulsating alternately; one placed somewhat above and in front of the other, near the pharyngeal passage; pedicel four to five times longer than the body. Length of the body and width of the expanded peristome field $\frac{1}{500}$ inch; width of the pedicel $\frac{1}{5000}$ inch. Habitat, pond water. Solitary or few together.

The characteristics by which this form may be readily distinguished from all Vorticellæ, are the existence and structure of the cuticular prominences and the undoubted presence of *two* contractile vesicles. The latter are in contour and position as stated above, but the writer would emphasize the fact of their duality. Hitherto no member of the genus has been observed with more than one pulsating vacuole, the latest generic diagnosis describing it as single without exception. The representation in the figure (Fig. 1, magnified 400 diameters) is somewhat diagrammatic, as both cannot be brought into focus at the same